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Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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Date	February 2, 2006

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OIPE IAP54 FEB 06 2006 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Ranjan PRASAD et al.
(Appellants)

Confirmation No. 3341

Group Art Unit No.: 2642

Examiner: Hector A. AGDEPPA

Serial No.: 09/800,646

Filed: March 6, 2001

For: METHOD AND APPARATUS FOR SELECTING AND MANAGING WIRELESS NETWORK SERVICES USING A DIRECTORY

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Applicants/Appellants hereby submit this Appeal Brief in support of the Notice of Appeal filed on December 5, 2005.

I. REAL PARTY IN INTEREST

Cisco Systems, Inc., which owns the assignee Cisco Technology, Inc., both of San Jose, California, are the real parties in interest.

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II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-11 and 13-22 are pending in this application, were finally rejected in the final Office Action mailed on October 6, 2005, and are the subject of this appeal. Claim 12 was canceled during prosecution.

IV. STATUS OF AMENDMENTS

No amendments were filed after the final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1 and 16-18 are independent. These independent claims recite similar features for modifying a subscription of a subscriber to one or more telecommunications services, except in the context of a method (Claim 1), a computer-readable medium (Claim 16), and an apparatus (Claims 17 and 18). Claim 5 is independent and recites a method for modifying subscriptions of a group of subscribers to one or more telecommunications services. Claim 9 is independent and recites of a method for automatically logging in a subscriber to all telecommunications services subscribed to by the subscriber. Claim 13 is independent and recites of a method for automatically subscribing a subscriber to a telecommunications service. Claims 19-22 are independent and comprise features for modifying a subscription of a subscriber to a telecommunications service, except in the context of a method (Claim 19), a computer-readable medium (Claim 20), and an apparatus (Claims 21 and 22).

The independent claims provide solutions to problems that arise in the management of network services for wireless personal digital assistants, cellular telephones, and other mobile computing devices. Typically, such network telecommunications services are provided by service providers, and may include, but are not limited to, videoconferencing, streaming video, personalized Internet, business-grade Internet, shopping, and gaming. (Specification, page 1, lines 4-11; page 1, line 24 to page 2, line 2.)

In one approach, services for a particular subscriber of a service provider are selected using a Service Selection Dashboard software element that communicates with a Service Selection Gateway software element. Using the Service Selection Dashboard, a network administrator selects one or more services and one or more service configuration parameters for a particular user. When service selection is completed, the Service Selection Dashboard transmits an information profile describing the selected services to the Service Selection Gateway, which notifies all other network elements (e.g. routers and switches) that need to know about the subscriber and the selected services. (Specification, page 1, lines 11-18.)

One problem with the above approach is that service selection is not dynamic. If a user subscribes to a new service, the service is not available unless the user logs out and then logs in again. Another problem with the above approach is that user management is cumbersome. Service enablement is carried out on a user-by-user basis and thus a particular service cannot be enabled for a group of users. Still another problem is that service subscription and other management functions are carried out with respect to individual users. Thus, subscribing a group of users to a default set of services based on a subscription level is not available. Yet another problem is that the lack of authorization controls allows any user to subscribe to any service.

Without an authorization model, however, differentiated services cannot be provided. (Specification, pages 2, lines 9-10; page 2, lines 13-15; page 2, line 3-8; page 2, lines 16-20.)

To address the above problems, the independent claims provide for: modifying a subscription of a subscriber to one or more telecommunications services; modifying subscriptions of a group of subscribers to one or more telecommunications services; automatically logging in a subscriber to all telecommunications services subscribed to by the subscriber; and automatically subscribing a subscriber to a telecommunications service.

Claim 1 recites a method for modifying a subscription of a subscriber to one or more telecommunication services based on subscriber information and service information that are stored in a directory repository. A determination is made whether the subscriber is currently logged in, and if the subscriber is not currently logged in, then the subscriber is directed to login through an authentication server. (At least Fig. 2A, Specification, page 14, lines 5-16.) A privilege token, which is associated with the authenticated subscriber and includes subscriber privilege information, is generated by an authorization service that is separate from the authentication server. (At least Fig. 2A, Specification, page 15, line 13 to page 16, line 3; Fig. 1.) A modification request to modify the subscription of the subscriber to the one or more telecommunication services is received. (At least Fig. 4A, Fig. 5A, and Specification, page 24, lines 15-21.) Based on the subscriber privilege information in the privilege token associated with the subscriber and generated by the authorization service, a determination is made whether the subscriber has sufficient privileges to carry out the requested modification. (At least Fig. 4A, Fig. 5B, and Specification page 22, lines 15-19.) If the subscriber is determined to have sufficient privileges, then first subscriber information and first service information representing only such services for which the subscriber is currently subscribed is retrieved from the directory

repository. (At least Fig. 2A, Fig. 4A, and Specification, page 17, lines 7-10; page 20, lines 11-18; page 23, lines 9-21.) The first subscriber information and the first service information are modified to reflect the requested modification, and the modified information is sent back to the directory repository resulting in creating and storing second service information in the directory repository that reflects the modification. (At least Fig. 2A, Fig. 5B, and Specification, page 25, lines 14-22.) An engagement request is generated to engage the telecommunication service for the subscriber in order to fulfill the modification request. (At least Fig. 2B, Fig. 5B, and Specification, page 18, lines 7-15.)

Claim 5 recites a method of modifying subscriptions of a group of subscribers to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository. A request from an administrator of the group to modify the subscriptions of the subscribers to the one or more telecommunications services is received. (At least Specification, page 8, lines 5-9 and 22-24; page 28, line 21 to page 29, line 2.) Based on the subscriber privilege information in a privilege token associated with the administrator and generated by the authorization service, a determination is made whether the subscriber has sufficient privileges to carry out the requested modification. (At least Fig. 4A, Fig. 5B, and Specification, page 22, lines 15-19.) If the administrator is determined to have sufficient privileges, then current subscriber information and current service information representing the then-current services to which the group of subscribers is currently subscribed is retrieved from the directory repository. (At least Fig. 2A, Fig. 4A, and Specification, page 17, lines 7-10; page 20, lines 11-18; page 23, lines 9-21.) The current subscriber information and the current service information are modified to reflect the modification requested by the administrator, and the modified information is sent to the directory repository resulting in creating and storing updated

service information in the directory repository that reflects the modification. (At least Fig. 2A, Fig. 5B, and Specification, page 25, lines 14-22.) One or more requests are generated to subscribe the telecommunication service to the group of subscribers in order to fulfill the modification request of the administrator. (At least Fig. 2B, and Specification, page 18, line 25 to page 9, line 2.)

Claim 9 recites a method of automatically logging in a subscriber to all telecommunications services subscribed to by the subscriber based on subscriber information and service information that are stored in a directory repository. A request from the subscriber to log in to the telecommunications services is received. (At least Fig. 2B, and Specification, page 17, lines 11-18.) The subscriber is authenticated by an authentication server. (At least Fig. 2A, and Specification, page 14, lines 21-24.) A privilege token, which is associated with the subscriber and includes subscriber privilege information, is generated by an authorization service that is separate from the authentication server. (At least Fig. 2A, and Specification, page 15, line 13 to page 16, line 3; Fig. 1.) A determination whether the subscriber is allowed to automatically log into the telecommunication services is made based on the subscriber privilege information in the generated privilege token. (At least Fig. 2B, and Specification, page 16, lines 4-18.) If the subscriber is allowed to automatically log into the telecommunication services, a list of all services for which the subscriber is then currently subscribed is received from the directory repository, and the subscriber is logged into all services identified in the list. (At least Fig. 2B, and Specification, page 17, lines 11-14; page 18, lines 16-17.)

Claim 13 recites a method of automatically subscribing a subscriber to a telecommunications service based on subscriber information and service information that are stored in a directory repository. A request from the subscriber to obtain a list of available

telecommunications services is received. (At least Fig. 5A, and Specification, page 24, lines 18-21.) A list of only those telecommunication services for which the subscriber has a privilege to subscribe to is generated based on privilege information and service information that are stored in the directory repository and are associated with the subscriber, where the privilege information specifies what telecommunication services the subscriber has privileges to subscribe to. (At least Fig. 5A, and Specification, page 24, line 22 to page 25, line 10.) A subscriber selection of one of the telecommunication services from the generated list is received. (At least Fig. 5B, and Specification, page 25, lines 11-22.) Verification is made that the subscriber has privileges that permit the subscriber to subscribe to the selected telecommunications service. (At least Fig. 5B, and Specification, page 25, lines 23-26.) Updated subscription information is then created and stored in the directory repository. (At least Fig. 5B, and Specification, page 25, line 26 to page 26, line 2.) A request to subscribe the subscriber to the selected telecommunication service is generated based on the updated subscription information. (At least Fig. 5B, and Specification, page 25, lines 18-22; page 26, lines 3-6.)

Claim 19 recites a method for modifying a subscription of a subscriber to a telecommunication service based on information stored in a directory repository. A request to identify one or more services to which a subscriber is subscribed is received, where the request is based on a prior request to modify the subscription of the subscriber to the telecommunication service. (At least Specification, page 3, lines 1-13, page 19, lines 23-24.) A list of the one or more services to which the subscriber is currently subscribed is generated based on group membership of the subscriber, one or more roles occupied by the subscriber, and authorization information associated with the subscriber that is stored in the directory repository, where the one or more roles are mapped to privileges that specify telecommunication services a subscriber

having that role can subscribe to. (At least Specification, page 3, lines 1-13, page 8, lines 10-17; page 8, line 25 to page 9, line 8; page 16, lines 5-8.) Individual service information for each of the one or more services in the list is generated based on subscriber information and service information that is stored in the directory repository for use in automatically subscribing the subscriber to a service that is represented by the individual service information. (At least Fig. 5A-5B, and Specification, page 3, lines 14-19; page 25, lines 14-22.)

Claim 17 is a means-plus-function claim. In one embodiment, the means for determining whether the subscriber is currently logged in, the means for directing the subscriber to log in through an authentication server, the means for receiving a modification request, and the means for determining whether the subscriber has privileges sufficient to carry the requested modification all correspond to the Service Selection Dashboard 110 and its functions as illustrated in Fig. 1 and described in the Specification at pages 9-11 and 14-19. In this embodiment, the means for sending and receiving information from the directory repository, the means for modifying the information received from the directory repository, and the means for generating engagement requests all correspond to the Directory-Enabled Service Selection System 112 and its functions as illustrated in Fig. 1 and described in the Specification at pages 11-13, 17-19, and 19-21. The means for generating a privilege token correspond to Authorization Service 114 and its functions as illustrated in Fig. 1 and described in the Specification at pages 10-11, 15-16, and 19-20.

Claim 21 is a means-plus-function claim. In one embodiment, the means for receiving a request to identify one or more services to which a subscriber is currently subscribed and the means for generating a list of the one or more services to which the subscriber is currently subscribed all correspond to the Service Selection Dashboard 110 and its functions as illustrated

in Fig. 1 and described in the Specification at pages 9-11 and 14-19. In this embodiment, the means for generating individual service information for each of the one or more services in the list corresponds to the Directory-Enabled Service Selection System 112 and its functions as illustrated in Fig. 1 and described in the Specification at pages 11-13, 17-19, and 19-21.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-4, 9-11, and 13-18 stand rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over An et al., U.S. Patent No. 6,031,904 (hereinafter "AN") in view of Lloyd et al., U.S. Patent No. 6,219,790 (hereinafter "LLOYD"), and further in view of Kodosky et al., U.S. Patent No. 6,173,438 (hereinafter "KODOSKY").

2. Claims 5-8 and 19-22 stand rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD, further in view of KODOSKY, and further in view of Sladek et al., U.S. Patent No. 6,622,016 (hereinafter "SLADEK").

VII. ARGUMENT

A. Introduction

To establish *prima facie* case of obviousness under 35 U.S.C. § 103(a), all the claim limitations must be taught or suggested by the references cited and relied upon. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In addition, a sufficient factual basis to support the obviousness rejection must be proffered. *In re Freed*, 165 USPQ 570 (CCPA 1970); *In re Warner*, 154 USPQ 173 (CCPA 1967); *In re Lunsford*, 148 USPQ 721 (CCPA 1966). Further, there must be some suggestion or motivation to modify the references or to combine the references' teachings to make the claimed combination; the suggestion or motivation to make the claimed combination must be found in the prior art, not in the applicant's disclosure. *In re Vaeck*, 947

F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Finally, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

The final Office Action in the present application fails to satisfy these criteria for the rejections of the pending claims, including independent Claims 1, 5, 9, 13, 16-18, and 19-22. Specifically, Claims 1-4, 9-11, and 13-18 include one or more features that are not taught or suggested by AN, LLOYD, and KODOSKY. Further, Claims 5-8 and 19-22 include one or more features that are not taught or suggested by AN, LLOYD, KODOSKY, and SLADEK. In addition, the art provides no suggestion or motivation to combine AN and KODOSKY. For these reasons, the rejection of Claims 1-11 and 13-22 under 35 U.S.C. § 103(a) are clearly erroneous, and should be reversed.

B. Independent Claim 1 is patentable over AN in view of LLOYD and further in view of KODOSKY because these references do not teach or suggest all features of the claim

Claim 1 is patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD, and further in view of KODOSKY because Claim 1 includes one or more features that are not taught or suggested by AN, LLOYD and KODOSKY.

Claim 1 comprises the features of:

> determining whether the subscriber is currently logged in, and if the subscriber is not currently logged in, directing the subscriber to log in through an authentication server and **generating, by an authorization service, a privilege token associated with the authenticated subscriber that includes subscriber privilege information, wherein said authorization service is separate from said authentication server**;
> receiving a modification request to modify the **subscription of the subscriber to the one or more telecommunication services**;
> **determining, based on subscriber privilege information in the privilege token associated with the subscriber generated by the authorization service,**

whether the subscriber has privileges sufficient to carry out the requested modification;

if the subscriber is determined to have sufficient privileges, then performing the steps of:

receiving, from the directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed;

modifying the first subscriber information and first service information to reflect the modification;

sending the modified information to the directory repository, resulting in **creating and storing, in the directory repository, second service information that reflects the modification;**

generating an engagement request to engage the telecommunication service for the subscriber in order to fulfill the modification request.

AN, LLOYD, and KODOSKY, when taken alone or in combination, do not teach or suggest the above features of Claim 1.

The final Office Action does not provide any **specific** citations to AN, LLOYD, and KODOSKY, and does not specifically identify what exactly in these references is equivalent to each of the features of Claim 1. Instead, the final Office Action makes the extremely broad and very general assertions that: (1) AN describes means and method for modifying a subscriber's features profile; (2) tokens are very old and well known in the art as merely one means of effecting validation, and that KODOSKY teaches a system and method of using tokens; and (3) LLOYD teaches authentication, authorization, and accounting server. In support of these assertions, the final Office Action provides the following citations: (1) from AN - Fig. 2, col. 4, line 17 to col. 5, line 34, and col. 5, line 49 to col. 9 line 30; (2) from KODOSKY – Fig. 16 and col. 20, lines 10-39; and (3) from LLOYD – Abstract, Fig. 2, col. 1, line 10 to col. 4, line 29. By making such non-specific citations to large portions from these references, especially from AN and LLOYD, the final Office Action apparently disregards and fails to consider many features that are expressly recited in Claim 1. Further, the extremely broad and vague citations to AN and LLOYD do not provide the Appellants with adequate notice or reasonable particularity with

respect to the basis of the rejection of Claim 1. As a result, the Appellants have had to engage in guesswork to determine the basis of the rejection. The Appellants cannot see any structure or functions in the cited references that correspond to all features recited in Claim 1.

a. A privilege token associated with an authenticated subscriber and including subscriber privilege information, which is used to determine whether the subscriber has privileges sufficient to carry out a requested subscription modification

Claim 1 comprises the features of a privilege token that is associated with the authenticated subscriber and that includes subscriber privilege information, and determining, based on the subscriber privilege information in the privilege token, whether the subscriber has sufficient privileges to carry out a requested modification to a subscription of the subscriber. In contrast, AN, LLOYD and KODOSKY do not teach or suggest any such feature.

The Office asserts that KODOSKY describes a privilege token that is equivalent to the privilege token featured in Claim 1. Specifically, the final Office Action asserts that in Fig. 16, and in col. 20, lines 10-39, KODOSKY describes such a privilege token. This assertion is incorrect.

KODOSKY teaches that a token can be used to arbitrate who has read/write privilege to different fields of a particular shared memory block. (Col. 20, lines 10-13.) Thus, the token in KODOSKY is a generic token used to determine which entity currently has read/write privileges to a shared memory block associated with the token. As shown in Fig. 16 and described in col. 20, lines 31-32 of KODOSKY, only token owners can read and write data in the fields of the shared memory block at any given time; non-token owners have to wait until they receive the token associated with the shared memory block (col. 20, lines 45-46). In this way, KODOSKY ensures that token owners will make sure that the data in the shared memory block is in a consistent state before passing the token, and that there will be no case where two sides have

write privileges to same field of the shared memory block at any given time. (Col. 20, lines 34-39.)

In contrast, the privilege token featured in Claim 1 is associated with an **authenticated** subscriber and includes subscriber privilege information, which is used to determine whether the authenticated subscriber has sufficient privileges to carry out a requested subscription modification. Since KODOSKY does not describe or suggest anything even remotely related to a subscriber, the read/write token in KODOSKY does not and cannot possibly include any information that is associated with an authenticated subscriber or with subscriber privilege information as featured in Claim 1.

The Office attempts to "patch-up" these deficiencies of the teaching of KODOSKY by making factually unsubstantiated assertions regarding the nature and the general use of tokens. Specifically, in pages 3-4, the final Office Action asserts that

> Even in networking, as a term of art, a token is merely a set of bits that if the network recognizes, allows the data tagged with that token access to transmit/travel over the network. . . . . It would have been obvious for one of ordinary skill in the art to use a privilege token method of validation inasmuch as again, it is merely one of a plurality of well known methods of validation.

The above general assertion has nothing to do with the specific use of a privilege token that is featured in Claim 1. The assertion only attempts to disguise the fact that the Office has failed to establish a prior disclosure of a feature expressly recited in the claim.

Further, the Office asserts that Goldsmith, U.S. Patent No. 6,064,990 (hereinafter "GOLDSMITH") teaches that it is old and well known to use authentication tokens for preventing unauthorized access, that Sawyer et al., U.S. Patent No. 6,324,271 (hereinafter "SAWYER") teaches a system and method of call identification authentication, and that Somers et al., U.S. Patent Publication No. 2002/0116396 (hereinafter "SOMERS") teaches using access authorization token data having different levels of access stored on the token. Neither of

GOLDSMITH, SAWYER, or SOMERS, however, teaches or suggests the feature of Claim 1 of a privilege token that is associated with an authenticated subscriber and includes subscriber privilege information, which is used to determine whether the authenticated subscriber has sufficient privileges to carry out a requested subscription modification.

For example, GODLSMITH describes the use of an encrypted token to conduct financial transaction for accounts to which the token permits access (GOLDSMITH, col. 1, lines 14-19), but this use is different than determining, based on subscriber privilege information included in a privilege token, whether a subscriber has privileges sufficient to carry out a subscription modification, as featured in Claim 1. SAWYER describes using a token to **authenticate** a caller's identity in a telephone system, where the token is a smart card or other integrated circuit device. (SAWYER, Abstract, col. 2, lines 8-24.) Thus, while Claim 1 features an intangible privilege token that is associated with an authenticated subscriber, SAWYER at most teaches use of a physical device as a token to authenticate a caller's identity. Finally, SOMERS describes a system for exchanging personal contact information by providing tokens that identify sets of contact information, which can be retrieved by presenting the token. (SOMERS, paragraphs [0020]-[0021].) Thus, in SOMERS the tokens identify sets of information and are used to retrieve such sets of information, while in Claim 1 subscriber privilege information included in a token used to determine whether a subscriber has sufficient privileges to modify the subscriber's subscription to services.

For the above reasons, AN, LLOYD, and KODOSKY do not teach, describe, or suggest the features of Claim 1 of a privilege token that is associated with the authenticated subscriber and that includes subscriber privilege information, and determining, based on the subscriber privilege information in the privilege token, whether the subscriber has sufficient privileges to

carry out a requested modification to a subscription of the subscriber.

b. Generating a privilege token by an authorization service that is separate from an authentication sever

In Claim 1, an authorization service that is separate from the authentication server generates a privilege token, which includes subscriber privilege information for an authenticated user. In contrast, AN, LLOYD, and KODOSKY do not include anything that is equivalent to this feature of Claim 1.

The Office asserts that this feature of Claim 1 is disclosed by LLOYD. Specifically, the final Office Action asserts that LLOYD describes this feature in its Abstract, in Fig. 2, and in col. 1, line 10 to col. 4, line 29. There is nothing in LLOYD that is equivalent to an authorization service that is separate from an authentication server.

In Fig. 2, LLOYD describes an Authentication, Authorization, and Accounting (AAA) server. The AAA server in Fig. 2, however, clearly shows authentication and authorization (AA) module 232, that performs both authentication and authorization functions. (See also LLOYD, Abstract, and col. 7, lines 24-33.) Further, the passages from LLOYD cited in the final Office Action do not teach, describe, or suggest that any component, which is separate from the AAA server, is capable of performing authorization functions. Finally, LLOYD does not even mention the term "token", let alone teach of suggest that the AA module 232 is capable of generating a privilege token such as the privilege token featured in Claim 1.

The Office asserts that LLOYD, by virtue of describing an AAA server, inherently suggests an authorization service that is separate from the AAA server. Specifically, in page 5, the final Office Action states:

> Although server 118 is a single server, Fig. 1 shows that even at least on an object-level, authentication and authorization are separate elements or acts and therefore, it still would have been obvious for one of ordinary skill in the art at the time the invention was made to have used two separate servers. Motivations for

> doing so are because they can be considered to be two separate actions that deserve their own separate servers. However, because as operations, they are so intertwined, for the sake of saving resources or streamlining operations, they can be implemented in a single server as shown. Either is ample motivation for using either method – separate or together.

In the above passage, the Office admits that LLOYD does not describe an authorization service that is separate from an authentication server. Further, while the Office attempts to assert that LLOYD suggests that an authorization service can be separate from an authentication server, the Office offers only a factually unsubstantiated statement and does not cite any passages from LLOYD that support such an assertion. Because in LLOYD the only description of an authorization service is in the context of an AA module in an integrated AAA server, LLOYD would not have suggested to one of ordinary skill an authorization service that is separate from an authentication server as featured in Claim 1. Only hindsight review of Appellants' disclosure motivates such separation.

For the above reasons, AN, LLOYD, and KODOSKY do not teach, describe, or suggest the feature of Claim 1 generating a privilege token by an authorization service that is separate from an authentication sever.

c. A directory repository that stores subscriber information and service information

Claim 1 also comprises: receiving, from a directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed; and sending the modified information to the directory repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification. In contrast, AN, LLOYD, and KODOSKY, when taken alone or in combination, do not teach or suggest these features of Claim 1.

In rejecting Claim 1, the Office completely ignores the above features of Claim 1. Specifically, the final Office Action provides no citations to any passages in AN, LLOYD, or KODOSKY that describe storing subscriber information and service information in a directory repository. Instead, the final Office Action seems to assert that the profile repository shown in Figs. 1 and 2 of AN is equivalent to the directory repository of Claim 1. This is incorrect.

In col. 3, lines 25-32, AN states that

> Each service manager has access to a respective profile repository 18 which identifies which features are to be provided on each line 10. The profile repository 18 for a given service manager is a memory storage allocation which may be stored on the respective service manager node 16, on the machine (such as a switch forming part of the PSTN) which implements the features, or on some other intermediate machine.

Thus, while AN suggests that a profile repository may store information that identifies what features are provided on a subscriber's telephone line, nothing in AN is equivalent to the features of Claim 1 of subscriber information and service information that are stored in a directory repository.

Further, absolutely nothing in AN teaches or suggests that the profile repository is organized as a directory. On page 13, the final Office Action interprets the feature of Claim 1 of "directory repository" to mean "any storage means." Such an interpretation reads an express term out of the claim contrary to the applicable case law. It is well-settled that "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

For at least the above reasons, AN, LLOYD, and KODOSKY do not teach, describe, or suggest the features of Claim 1 of: receiving, from a directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed; and sending the modified information to the directory

repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification.

For all the foregoing reasons, the rejection of Claim 1 under 35 U.S.C. §103(a) over AN in view of LLOYD, and further in view of KODOSKY is unsupported in the cited references. Reversal of the rejection is respectfully requested.

C. Independent Claim 1 is patentable over AN in view of LLOYD and further in view of KODOSKY because there is no suggestion or motivation to combine AN and KODOSKY

In rejecting Claim 1, the Office has not provided a suggestion or motivation to combine AN and KODOSKY in order to make the combination of features of Claim 1. The fact that references can be combined is not sufficient to provide the suggestion or motivation required to establish obviousness under 35 U.S.C § 103(a). Further, modifying AN according to the teachings of KODOSKY would violate the principle of operation of AN. Finally, there is no motivation to combine AN and KODOSKY because they are not analogous art.

a. The final Office Action has not provided a suggestion or motivation to combine AN and KODOSKY, and one skilled in the art would not be motivated to modify AN to include a token as taught by KODOSKY

As stated by the Court of Appeals for the Federal Circuit, "[t]o imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of hindsight syndrome where that which only the inventor taught is used against its teacher." *W.L. Gore & Assocs v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir 1983). The Federal Circuit has recently re-iterated that "the tests of whether to combine references need to be applied rigorously." *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). Broad, conclusory statements regarding the teaching of multiple

references, standing alone, are not "evidence," (*McElmurrary v. Arkansas Power & Light Col.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cit. 1993)), and a general relationship between fields of the prior art references is insufficient to suggest the motivation to combine such references (see *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)).

Guided by the foregoing principles, the final Office Action, which states that "[i]t would have been obvious for one of ordinary skill in the art to use a privilege token method of validation inasmuch as ... it is merely one of a plurality of well known methods of validation", does not meet the standard for an obviousness rejection under 35 U.S.C. §103(a). The goals in this statement are so general and vague that they cannot rationalize the specific invention that is claimed. It is "impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious" and that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992); quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

AN describes a system and method for allowing a telephone subscriber to update, over the Internet, the features that are provided on the subscriber's telephone line. (AN, Abstract.) The subscriber is required to **authenticate** itself by providing a telephone number (or Directory Number (DN)) and a PIN or password. (AN, Fig. 4; col. 1, lines 34-38; col. 5, lines 12-17.) Upon verification of the telephone number and the password, a Web server **provides access** to a series of HTML pages containing information associated with the particular telephone line. (AN, col. 5, lines 17-21.) Thus, in AN once a subscriber is authenticated based on his or her telephone

number and password, the subscriber is allowed access to browse and modify the features provided on his or her telephone line.

Since the purpose of the system in AN is to provide subscribers with **access** to their telephone line features over the Internet, and since AN already provides a simple and straightforward mechanism for authenticating the subscribers, there is absolutely no need to modify AN to provide any additional authentication of the subscriber. Furthermore, neither AN nor any of the other cited references provides any reason for modifying AN to include an **authorization service**, which is separate from the authentication server and is capable of generating privilege tokens, as featured in Claim 1.

For the above reasons, one of ordinary skill in the art would not be motivated to modify AN to include mechanisms that use tokens as taught by KODOSKY. Further, in light of the above reasons, the final Office Action uses impermissible hindsight gained from the Appellants' disclosure to combine the cited references.

b. The fact that references can be combined or modified is not sufficient to establish *prima facie* case of obviousness under 35 U.S.C. § 103(a)

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *Id.*, 916 F.2d at 682, 16 USPQ2d at 1432. In addition, the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish prima facie obviousness. See *Ex parte Levengood,* 28 USPQ2d 1300 (Bd. Pat. App. & Inter 1993). The level of skill in the art cannot be relied upon to provide

the suggestion to combine references. *Al-site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

The final Office Action does not state any specific **motivation** that is found in AN, or in the knowledge generally available to one of ordinary skill in the art, for AN to use a privilege token as featured in Claim 1. The final Office Action merely states that "a token method of validation ... is merely one of a plurality of well known methods of validation." Even if a privilege token were one of a plurality of well-known methods of validation, this would not be in itself a sufficient motive to use a privilege token in the system described in AN. In fact, this argument in the final Office Action is self-defeating because it begs the question: if indeed there were a "plurality of well-known methods of validation", why would one of skill in the art pick specifically the "privilege token" method, and not any other "well-known" method?

As discussed above, AN teaches that an authentication server validates a user's right to access and update features provided on a specific telephone line through the use of a telephone number associated with the line and a PIN or a password of the user. (AN, col. 7, lines 50-54.) While there may exist various authentication methods that can be used to authenticate a user in AN, there is absolutely no motivation or suggestion that it is desirable to specifically use an authentication mechanism with a privilege token that includes subscriber privilege information associated with the subscriber, as featured in Claim 1.

c. Modifying AN to use a privilege token generated by an authorization service would violate the principle of operation of AN

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

AN teaches that an authentication server validates a user's right to access and update features provided on a specific telephone line through the use of a telephone number associated with the line and a PIN or a password of the user. Thus, in AN a principle of operation is to use a single-step password-based authentication mechanism, which is sufficient for providing the users with access to modify the features provided on their telephone lines with no further authorization being necessary.

In contrast, if the AN system is modified to include privilege tokens as means for **authorizing** users to access the features provided on their telephone lines, then the principle of operation in AN of using a single-step authentication mechanism would be violated. Users attempting to access the features on their telephone lines would need to be authenticated in a first step, and then, in a second step, an authorization token would be generated for an authenticated user. For this reason, modifying AN to implement tokens, such as the tokens described in KODOSKY, would violate a principle of operation of AN.

d. AN and KODOSKY cannot be combined because they are not analogous art

"In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

The present application is concerned with managing wireless network service subscriptions. In contrast, KODOSKY deals with providing a flexible programming environment that allows users to design virtual instrumentation applications. The graphical programs created using the system of KODOSKY can be downloaded to an embedded system for execution in a real-time manner. KODOSKY also provides a method for automatically

generating an embedded application in response to a graphical program created by a user. (KODOSKY, col. 3, line 61 to col. 4, line 4.) Thus, the teachings of KODOSKY are not at all pertinent to the problem of managing wireless network service subscriptions.

In a case in which a combination of two references were used in support of an obviousness rejection, the Federal Circuit has stated that "[t]he combination of elements from non-analogous art sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination." *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Therefore, *In re Oetiker* stands for the proposition that it is not proper to combine non-analogous prior art. With respect to the present application, one skilled in the art of managing wireless network service subscriptions does not have to turn to the teachings of KODOSKY for any reason, much less to find motivation or suggestion to combine the authentication mechanism described in AN with a token for managing read/write access to a shared memory block as described in KODOSKY.

For all the foregoing reasons, Claim 1 is patentable under 35 U.S.C. §103(a) over AN in view of LLOYD, and further in view of KODOSKY because there is no suggestion or motivation to combine the cited references. Reversal of the rejection is respectfully requested.

D. Dependent Claim 2 is patentable over AN in view of LLOYD and further in view of KODOSKY

Dependent Claim 2 has been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Claim 2 depends from independent Claim 1 and thus includes each and every feature of the independent claim. Therefore, Claim 2 is patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY for at least the reasons given above with respect to Claim 1.

In addition, Claim 2 includes one or more features that independently render it patentable. For example, Claim 2 comprises the features of:

> wherein the authorization service generates the privilege token by the steps of:
> receiving a user name associated with the subscriber and **mapping the user name to a distinguished name in the directory repository;**
> **creating and storing as subscriber privilege information in the privilege token one or more roles occupied by the subscriber based on role information that is stored in the directory repository, said stored role information including mapping information that maps a role to one or more privileges that specify which telecommunications services a subscriber having that role can subscribe to.**

AN, LLOYD, and KODOSKY, do not describe or suggest any of these features of Claim 2. Specifically, since neither of these references describes or suggests storing subscriber information in a directory repository, these references cannot possibly teach the above features of Claim 2.

Furthermore, in rejecting Claim 2, the final Office Action admits that AN does not teach mapping a user name to a distinguished name in a directory repository. However, the final Office Action asserts in page 7 that "mapping names or other identifiers is also old and well known in the art and would be merely a design choice or preference for one of ordinary skill in the art at the time the invention was made." The final Office Action further asserts that the Directory Number (DN) mapper described in col. 7, lines 33-48 in AN is equivalent to the feature of mapping a user name to a distinguished name in a directory repository. These assertions are incorrect.

First, a factually unsubstantiated assertion by the Office that a feature in a claim is "old and well known in the art" is not the standard for rejecting a claim under 35 U.S.C. § 103(a). It is never appropriate to rely solely on alleged common knowledge in the art without documentary support in the record as the principal evidence upon which a rejection is based. See *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001); *In re Ahlert*, 424 F.2d 1088, 1092, 165 USPQ 418, 422 (CCPA 1970). Second, the Directory Number mapper described in AN "maps Directory Numbers to specific service managers, and returns a service manager class to support selecting the appropriate service manager adaptor 138." (AN, col. 8, lines 1-4.) Thus, the Directory Number mapper in AN maps a telephone number to a service manager and is not equivalent to the feature of Claim 2 of mapping a user name associated with a subscriber to a distinguished name in a directory repository.

Regarding the feature of Claim 2 of creating and storing as subscriber privilege information in the privilege token one or more roles occupied by the subscriber based on role information that is stored in the directory repository, the final Office Action asserts in page 7 that "a subscriber in An et al. may have more than one line, i.e. a landline, a wireless subscription, pager service, local and/or long distance service etc. read as the claimed roles." The final Office Action provides no citations from AN to support this assertion. The final Office Action seems to contend that a **type** of a telephone line or number to which a user can subscribe is a role. In contrast, Claim 2 recites that the one or more roles are roles which are **occupied by a subscriber**.

For all the foregoing reasons, the rejection of Claim 2 under 35 U.S.C. §103(a) over AN in view of LLOYD, and further in view of KODOSKY is unsupported in the cited references. Reversal of the rejection is respectfully requested.

E. Dependent Claims 3 and 4 are patentable over AN in view of LLOYD and further in view of KODOSKY

Dependent Claims 3 and 4 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Each of Claims 3 and 4 depends from independent Claim 1, and thus includes each and every feature of the independent claim. Therefore, Claims 3 and 4 are patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY for at least the reasons given above with respect to Claim 1.

In addition, each of Claims 3 and 4 includes one or more additional features that independently render it patentable. For example, Claim 3 includes the feature of determining whether the subscriber is currently logged in by determining whether a host object that uniquely identifies the subscriber exists. Claim 4 includes the features of subscribing the subscriber to the service by creating and storing a relation of a subscriber object that programmatically represents the subscriber to a service object that programmatically represents the service, and creating and storing one or more attribute values in the relation, where the attribute values define the subscription. In contrast, absolutely nothing in AN, LLOYD, and KODOSKY is even remotely similar, let alone be equivalent to, these features of Claims 3 and 4.

The final Office Action rejects Claims 3 and 4 by stating in page 8:

> As to claims 3 and 4, such limitations merely address the programming level aspect of the invention, i.e. object-oriented languages that would implement the profile and validation aspects of the present invention. While An et al. describes the validation on a much higher level, such would also be obvious if not inherent in An et al. inasmuch as most of the programming languages or protocols used in tele/data communications in recent years have been object-oriented and are necessary to effect the operation in computer-based systems.

The above rejection is improper because it is not based on commonly known facts, features inherently present in AN, or any other competent evidence whatsoever. The Office provides no

citations to AN and proffers no other documentary support in the above rejection of Claims 3 and 4. It is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based. See *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001); *In re Ahlert*, 424 F.2d 1088, 1092, 165 USPQ 418, 422 (CCPA 1970). Thus, for this reason alone the rejections of Claims 3 and 4 must be reversed.

In addition, Claims 3 and 4 are not reciting programming features per se; Claims 3 and 4 recite using programming features in a particular innovative way to implement specific actions in modifying a subscription of a subscriber to one or more telecommunication services based on subscriber information and service information that are stored in a directory repository. Nothing in AN, LLOYD, and KODOSKY teaches, describes, or suggests these features of Claims 3 and 4.

For the foregoing reasons, the rejections of Claims 3 and 4 under 35 U.S.C. §103(a) over AN in view of LLOYD, and further in view of KODOSKY are unsupported in the cited references. Reversal of the rejections is respectfully requested.

F. Independent Claims 16-18 are patentable over AN in view of LLOYD and further in view of KODOSKY

Independent Claims 16-18 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Claims 16-18 include features similar to Claim 1 discussed above, except in the context of a computer-readable medium (Claim 16) and an apparatus (Claims 17-18). Thus, for the same reasons discussed above with respect to Claim 1, the rejections of Claims 16-18 are unsupported

by the cited references. Reversal of the rejections of Claims 16-18 under 35 U.S.C. § 103(a) is respectfully requested.

G. Independent Claims 9 and 13 are patentable over AN in view of LLOYD and further in view of KODOSKY

Independent Claims 9 and 13 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Claims 9 and 13 include features similar to Claim 1 discussed above. Thus, for at least the reasons discussed above with respect to Claim 1, the rejections of Claims 9 and 13 are not supported by the cited references, and therefore Claims 9 and 13 are patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY. Reversal of the rejections of Claims 9 and 13 are respectfully requested.

H. Dependent Claim 10 is patentable over AN in view of LLOYD and further in view of KODOSKY

Dependent Claim 10 has been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Claim 10 depends from independent Claim 9 and thus includes each and every feature of the independent claim. Therefore, Claim 10 is patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY for at least the reasons given above with respect to Claim 9. Reversal of the rejection of Claim 10 is respectfully requested.

I. Dependent Claim 11 is patentable over AN in view of LLOYD and further in view of KODOSKY

Dependent Claim 11 has been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY.

Claim 11 depends from independent Claim 9 and thus includes each and every feature of the independent claim. Therefore, Claim 11 is patentable under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY for at least the reasons given above with respect to Claim 9.

In addition, Claim 11 includes one or more features that independently render it patentable. For example, Claim 11 comprises the feature of storing the privilege token in a service selection gateway for use in subsequent authorization processes related to the subscriber. AN, LLOYD, and KODOSKY do not describe or suggest any such feature.

The final Office Action asserts that the Subscriber Service Provisioning Manager (SSPM) server 122 depicted in Fig. 14 of AN is equivalent to the service selection gateway featured in Claim 11. However, in AN neither the SSPM server nor any of its components stores any information that can be used for any subsequent authorization relating to a user that is already logged in. On the contrary, in col. 7, lines 53-54, AN expressly states that authentication server 136 (which is part of SSPM server 122) performs user authentication on a per transaction basis, i.e. the authentication server in AN authenticates the user every time the user requests to modify a feature provided on the user's telephone line. In contrast, Claim 11 includes the feature of storing the privilege token in a service selection gateway for use in subsequent authorization processes related to the subscriber.

For the foregoing reasons, the rejection of Claim 11 under 35 U.S.C. §103(a) over AN in view of LLOYD, and further in view of KODOSKY is unsupported in the cited references. Reversal of the rejection is respectfully requested.

J. Dependent Claims 14 and 15 are patentable over AN in view of LLOYD and further in view of KODOSKY

Dependent Claims 14 and 15 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over AN in view of LLOYD and further in view of KODOSKY.

Each of Claims 14 and 15 depends from independent Claim 13, and thus includes each and every feature of the independent claim. Thus, for at least the reasons given above with respect to Claim 13, the rejections of Claims 14 and 15 under 35 U.S.C. § 103(a) are unsupported by the cited references. Reversal of the rejections of Claims 14 and 15 is respectfully requested.

K. Independent Claims 5 and 19-22 are patentable over AN in view of LLOYD further in view of KODOSKY and further in view of SLADEK because these references to not describe or suggest all features of the claims

Independent Claims 5 and 19-22 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over AN in view of LLOYD further in view of KODOSKY and further in view of SLADEK.

Claims 5 and 19-22 includes features similar to the features of Claim 1 discussed above. Furthermore, in rejecting Claims 5 and 19-22 the final Office Action relies explicitly on AN, LLOYD, and KODOSKY, and not on SLADEK, to support prior disclosure of the features discussed above with respect to Claim 1. Thus, any combination of SLADEK with the other three references necessarily fails to teach the subject matter of Claims 5 and 19-22. Therefore, the rejections of Claims 5 and 19-22 are unsupported by the cited references for at least the reasons discussed above with respect to Claim 1. Reversal of the rejections of Claims 5 and 19-22 is respectfully requested.

L. Dependent Claims 6-8 are patentable over AN in view of LLOYD further in view of KODOSKY and further in view of SLADEK

Dependent Claims 6-8 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over AN in view of LLOYD further in view of KODOSKY and further in view of SLADEK.

Each of Claims 6-8 depends from independent Claim 5, and thus includes each and every feature of the independent claim. Thus, for at least the reasons given above with respect to Claim 5, the rejections of Claims 6-8 under 35 U.S.C. § 103(a) are unsupported by the cited references. Reversal of the rejections of Claims 6-8 is respectfully requested.

VIII. CONCLUSION AND PRAYER FOR RELIEF

Based on the foregoing, it is respectfully submitted that the rejections of Claims 1-11 and 13-22 lack the requisite legal and factual basis. Appellants therefore respectfully request that the Honorable Board reverse the rejections of Claims 1-4, 9-11, and 13-18 under 35 U.S.C. § 103(a) over AN in view of LLOYD and further in view of KODOSKY, and the rejections of Claims 5-8 and 19-22 under 35 U.S.C. § 103(a) over AN in view of LLOYD further in view of KODOSKY and further in view of SLADEK.

The fee of $500 under 37 C.F.R. § 41.20(b)(2) is enclosed. If the fee is missing or insufficient, the Director is hereby authorized to charge any applicable fee to our Deposit Account No. 50-1302.

Respectfully submitted,

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CLAIMS APPENDIX

1. A method of modifying a subscription of a subscriber to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository, the method comprising the computer-implemented steps of:

determining whether the subscriber is currently logged in, and if the subscriber is not currently logged in, directing the subscriber to log in through an authentication server and generating, by an authorization service, a privilege token associated with the authenticated subscriber that includes subscriber privilege information, wherein said authorization service is separate from said authentication server;

receiving a modification request to modify the subscription of the subscriber to the one or more telecommunication services;

determining, based on subscriber privilege information in the privilege token associated with the subscriber generated by the authorization service, whether the subscriber has privileges sufficient to carry out the requested modification;

if the subscriber is determined to have sufficient privileges, then performing the steps of:

receiving, from the directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed;

modifying the first subscriber information and first service information to reflect the modification;

sending the modified information to the directory repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification;

generating an engagement request to engage the telecommunications service for the subscriber in order to fulfill the modification request.

2. A method as recited in Claim 1, wherein the authorization service generates the privilege token by the steps of:

receiving a user name associated with the subscriber and mapping the user name to a distinguished name in the directory repository;

creating and storing as subscriber privilege information in the privilege token one or more roles occupied by the subscriber based on role information that is stored in the directory repository, said stored role information including mapping information that maps a role to one or more privileges that specify which telecommunications services a subscriber having that role can subscribe to.

3. A method as recited in Claim 1, wherein the step of determining whether the subscriber is currently logged in comprises determining whether a host object that uniquely identifies the subscriber exists, and wherein the privilege token associated with the subscriber is stored with the host object that uniquely identifies the subscriber.

4. A method as recited in Claim 1, wherein the step of generating an engagement request comprises the steps of subscribing the subscriber to the service by creating and storing a relation of a subscriber object that programmatically represents the subscriber to a service object that programmatically represents the service, and creating and storing one or more attribute values in the relation, wherein the attribute values define the subscription.

5. A method of modifying subscriptions of a group of subscribers to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository, the method comprising the computer-implemented steps of:

receiving from an administrator of the group, a request to modify the subscriptions of the subscribers to the one or more telecommunications services;

determining, based on subscriber privilege information in a privilege token that is associated with the administrator and is generated by an authorization service, whether the administrator has privileges sufficient to carry out the requested modification;

if the administrator is determined to have sufficient privileges, then performing the steps of:

receiving, from the directory repository, current subscriber information and current service information representing then-current services to which the subscribers are subscribed;

modifying the subscriber information and service information to reflect the modifications, resulting in creating and storing, in the directory repository, updated service information that reflects the modifications; generating one or more requests to subscribe the telecommunications service to the group of subscribers to fulfill the request of the administrator.

6. A method as recited in Claim 5, wherein the group of subscribers is defined explicitly by creating and storing a named group that contains one or more subscribers as group members.

7. A method as recited in Claim 5, wherein the group of subscribers is defined implicitly such that the group comprises one or more subscribers in an object tree of the directory repository who are subordinate in the tree to a container node of the tree.

8. A method as recited in Claim 5, further comprising the steps of subscribing one of the subscribers in the group to the service by creating and storing a relation of a subscriber object that programmatically represents the subscriber to a service object that programmatically represents the service, and creating and storing one or more attribute values in the relation, wherein the attribute values define the subscription.

9. A method of automatically logging in a subscriber to all telecommunications services subscribed to by the subscriber based on subscriber information and service

information that are stored in a directory repository, the method comprising the computer-implemented steps of:

receiving a request from the subscriber to log in to the telecommunications services;

authenticating the subscriber by an authentication server;

generating a privilege token associated with the subscriber by an authorization service, said privilege token including subscriber privilege information, wherein said authorization service is separate from said authentication server;

determining whether the subscriber is allowed to automatically log into the telecommunication services, said determination based on subscriber privilege information in the privilege token associated with the subscriber;

if the subscriber is allowed to automatically log into the telecommunications services, receiving, from the directory repository, a list of all services for which the subscriber is then currently subscribed, and automatically logging the subscriber into all services identified in the list.

10. A method as recited in Claim 9, wherein automatically logging the subscriber into all services identified in the list comprises the steps of:

for each of the services identified in the list:

obtaining service information that describes the services from the directory repository;

creating and storing a relation between a service object in the directory repository that uniquely identifies and represents each of the services

and privileges of the subscriber, and a subscriber object that uniquely represents the subscriber.

11. A method as recited in Claim 10, further comprising the steps of storing the privilege token in a service selection gateway for use in subsequent authorization processes relating to the subscriber.

12. (Canceled)

13. A method of automatically subscribing a subscriber to a telecommunications service based on subscriber information and service information that are stored in a directory repository, the method comprising the computer-implemented steps of:

receiving a request from the subscriber to obtain a list of available telecommunications services;

generating a list of only those telecommunications services for which the subscriber has a privilege to subscribe to, based on privilege information and service information that is stored in the directory repository and associated with the subscriber, said privilege information associated with the subscriber specifying what telecommunications services the subscriber has privileges to subscribe to;

receiving a subscriber selection of one of the telecommunications services from the generated list of telecommunications services;

verifying that the subscriber has privileges that permit the subscriber to subscribe to the selected telecommunications service;

creating and storing updated subscription information in the directory repository;

generating a request to subscribe the subscriber to the selected telecommunications service based on the updated subscription information.

14. A method as recited in Claim 13, wherein said privilege information associated with the subscriber is comprised of a privilege token for the subscriber that identifies a role of the subscriber, wherein the privileges of the subscriber to subscribe to a telecommunications service is determined by the role in the privilege token for the subscriber.

15. A method as recited in Claim 13, wherein generating a list of only those telecommunications services for which the subscriber has a privilege to subscribe to includes the step of generating and providing to the subscriber a custom display page that identifies only those telecommunications services for which the subscriber has a privilege to subscribe.

16. A computer-readable medium carrying one or more sequences of instructions for modifying a subscription of a subscriber to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

determining whether the subscriber is currently logged in, and if the subscriber is not currently logged in, directing the subscriber to log in through an authentication server and generating, by an authorization service, a privilege token associated with the authenticated subscriber that includes subscriber privilege information, wherein said authorization service is separate from said authentication server;

receiving a modification request to modify the subscription of the subscriber to the one or more telecommunications services;

determining, based on subscriber privilege information in the privilege token associated with the subscriber generated by the authorization service, whether the subscriber has privileges sufficient to carry out the requested modification;

if the subscriber is determined to have sufficient privileges, the one or more sequences of instructions which, when executed, further cause the one or more processors to carry out the steps of:

receiving, from the directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed;

modifying the first subscriber information and first service information to reflect the modification;

sending the modified information to the directory repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification;

generating an engagement request to engage the telecommunications service for the subscriber in order to fulfill the modification request.

17. An apparatus for modifying a subscription of a subscriber to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository, comprising:

means for determining whether the subscriber is currently logged in, and if the subscriber is not currently logged in, means for directing the subscriber to log in through an authentication server and means for generating a privilege token associated with the authenticated subscriber by an authorization service, said privilege token including subscriber privilege information, wherein said authorization service is separate from said authentication server;

means for receiving a modification request to modify the subscription of the subscriber to the one or more telecommunications services;

means for determining, based on subscriber privilege information in the privilege token associated with the subscriber generated by the authorization service, whether the subscriber has privileges sufficient to carry out the requested modification;

means for receiving, from the directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed;

means for modifying the first subscriber information and first service information to reflect the modification;

means for sending the modified information to the directory repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification;

means for generating an engagement request to engage the telecommunications service for the subscriber in order to fulfill the modification request.

18. An apparatus for modifying a subscription of a subscriber to one or more telecommunications services based on subscriber information and service information that are stored in a directory repository, comprising:

a network interface that is coupled to a data network that includes the directory repository for receiving information therefrom;

a processor;

one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

determining whether the subscriber is currently logged in, and if the subscriber is not currently logged in, directing the subscriber to log in through an authentication server and generating, by an authorization service, a privilege token associated with the authenticated subscriber that includes subscriber privilege information, wherein said authorization service is separate from said authentication server;

receiving a modification request to modify the subscription of the subscriber to the one or more telecommunications services;

determining, based on subscriber privilege information in the privilege token associated with the subscriber that is generated by the authorization service, whether the subscriber has privileges sufficient to carry out the requested modification;

if the subscriber is determined to have sufficient privileges, the one or more sequences of instructions which, when executed, further cause the processor to:

receiving, from the directory repository, first subscriber information and first service information representing only such services for which the subscriber is then currently subscribed;

modifying the first subscriber information and first service information to reflect the modification;

sending the modified information to the directory repository, resulting in creating and storing, in the directory repository, second service information that reflects the modification;

generating an engagement request to engage the telecommunications service for the subscriber in order to fulfill the modification request.

19. A method of modifying a subscription of a subscriber to a telecommunications service based on information stored in a directory repository, the method comprising the computer-implemented steps of:

receiving a request to identify one or more services to which a subscriber is subscribed, based on a prior request to modify the subscription of the subscriber to the telecommunications service;

generating a list of the one or more services to which the subscriber is currently subscribed, based on group membership of the subscriber, one or more roles occupied by the subscriber, and authorization information associated with the subscriber that is stored in the directory repository, wherein said one or more roles are mapped to one or more privileges that specify which telecommunications services a subscriber having that role can subscribe to;

generating individual service information for each of the one or more services in the list, based on subscriber information and service information that is stored in the directory repository, for use in automatically subscribing the subscriber to a service that is represented by the individual service information.

20. A computer-readable medium carrying one or more sequences of instructions for modifying a subscription of a subscriber to a telecommunications service based on subscriber information and service information that are stored in a directory repository, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

receiving a request to identify one or more services to which a subscriber is subscribed, based on a prior request to modify the subscription of the subscriber to the telecommunications service;

generating a list of the one or more services to which the subscriber is currently subscribed, based on group membership of the subscriber, one or more roles occupied by the subscriber, and authorization information associated with the subscriber that is stored in the directory repository, wherein said one or more roles are mapped to one or more privileges that specify which telecommunications services a subscriber having that role can subscribe to;

generating individual service information for each of the one or more services in the list, based on subscriber information and service information that is stored in the directory repository, for use in automatically subscribing the subscriber to a service that is represented by the individual service information.

21. An apparatus for modifying a subscription of a subscriber to a telecommunications service based on subscriber information and service information that are stored in a directory repository, comprising:

means for receiving a request to identify one or more services to which a subscriber is subscribed, based on a prior request to modify the subscription of the subscriber to the telecommunications service;

means for generating a list of the one or more services to which the subscriber is currently subscribed, based on group membership of the subscriber, one or more roles occupied by the subscriber, and authorization information associated with the subscriber that is stored in the directory repository, wherein said one or more roles are mapped to one or more privileges that

specify which telecommunications services a subscriber having that role can subscribe to;

means for generating individual service information for each of the one or more services in the list, based on subscriber information and service information that is stored in the directory repository, for use in automatically subscribing the subscriber to a service that is represented by the individual service information.

22. An apparatus for modifying a subscription of a subscriber to a telecommunications service based on subscriber information and service information that are stored in a directory repository, comprising:

a directory-enabled service selection framework that is coupled to the directory repository for receiving stored information therefrom;

a processor;

one or more stored sequences of instructions in the framework which, when executed by the processor, cause the processor to carry out the steps of:

receiving a request to identify one or more services to which a subscriber is subscribed, based on a prior request to modify the subscription of the subscriber to the telecommunications service;

generating a list of the one or more services to which the subscriber is currently subscribed, based on group membership of the subscriber, one or more roles occupied by the subscriber, and authorization information associated with the subscriber that is stored in the

directory repository, wherein said one or more roles are mapped to one or more privileges that specify which telecommunications services a subscriber having that role can subscribe to;

generating individual service information for each of the one or more services in the list, based on subscriber information and service information that is stored in the directory repository, for use in automatically subscribing the subscriber to a service that is represented by the individual service information.